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THE PROBABLE LIFE OF SINGLE-FAMILY RESIDENCES

MORE than 18 years ago, we published a bulletin on the estimated life of single-family residences, under the caption of "How Long Do Houses Live?" In the intervening period we have accumulated a tremendous amount of material not available at that time which can be used in the computation of a mortality table for buildings.

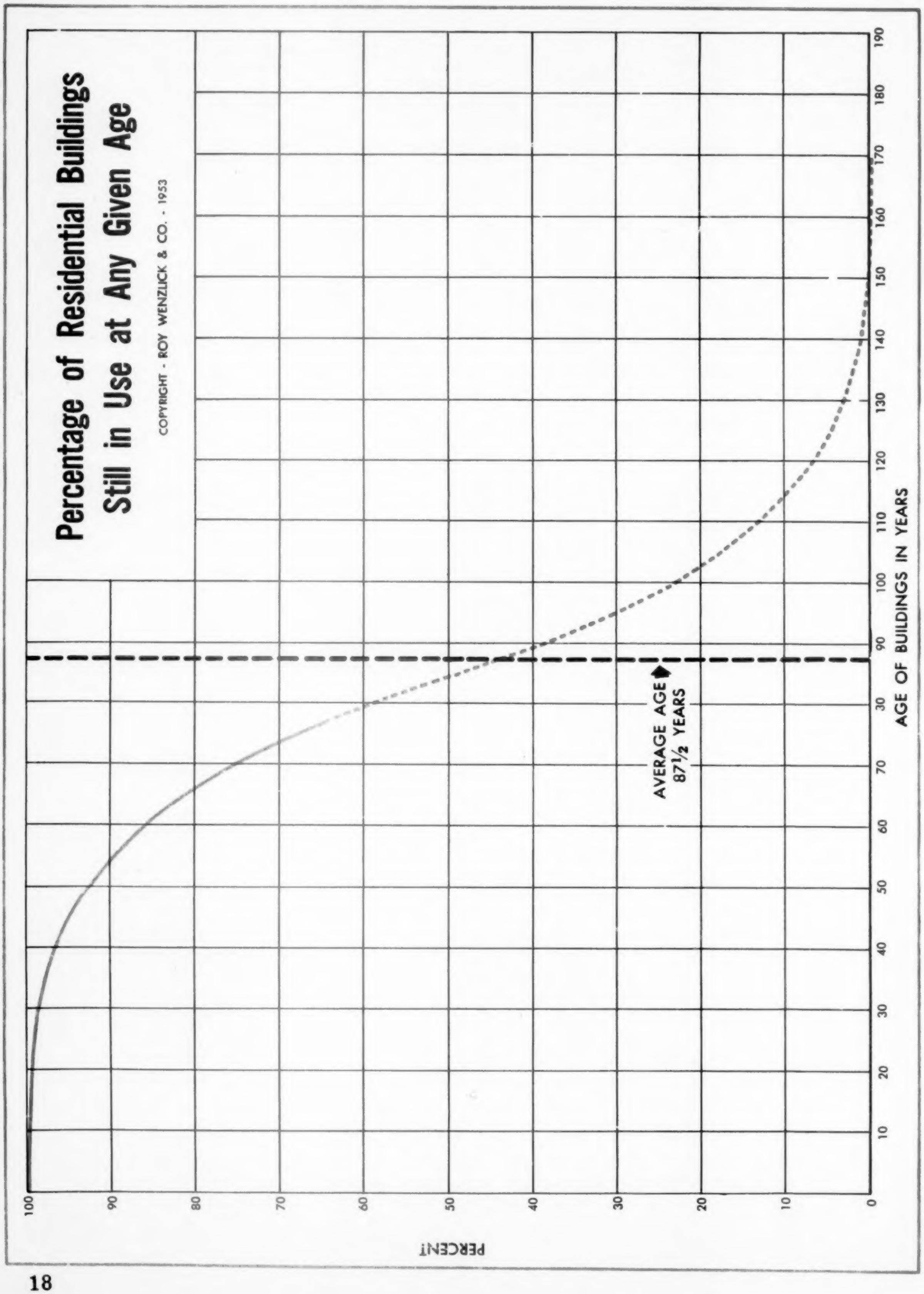
It is, of course, impossible to predict accurately the economic life of any particular building, just as it is impossible to forecast how long any one individual may live. A mortality table which will give life expectancy can be constructed for buildings, and the construction of such a table is the purpose of this study.

When a building is erected there is always a possibility that it may be destroyed by fire, tornado, earthquake, or other unpredictable forces within a few years of its completion. There is also the possibility that it may be the one building in a hundred which will last many times the average life of buildings of its class and type. These unpredictable possibilities do not affect value. Value depends on probabilities, and the degree of probability can be determined only by studying a large number of cases.

The appraiser is primarily interested in the probable remaining life of a building. The probable, not possible, length of this life should determine the rate of depreciation used.

Records of building permits in St. Louis are available from 1879 to the present. This is a period of 74 years. Twenty residence addresses were selected at random from the building permits for each year, which resulted in a list of approximately 1,500 properties, 20 built 74 years ago, 20 built 73 years ago, 20 built 72 years ago, etc., down to 20 buildings erected in 1952. Each of these properties was personally inspected and, if still standing, was graded on apparent deterioration and obsolescence. If the building was no longer standing, a careful record was made of the present use of the site. The type of construction was noted on the buildings and all were classified as to occupancy.

In an effort to carry the study to buildings older than 74 years, perspective drawings of six sections of St. Louis made in 1875 were checked in the field to find out how many of the buildings shown on these drawings are still standing.


Percentage of Residential Buildings
Still in Use at Any Given Age
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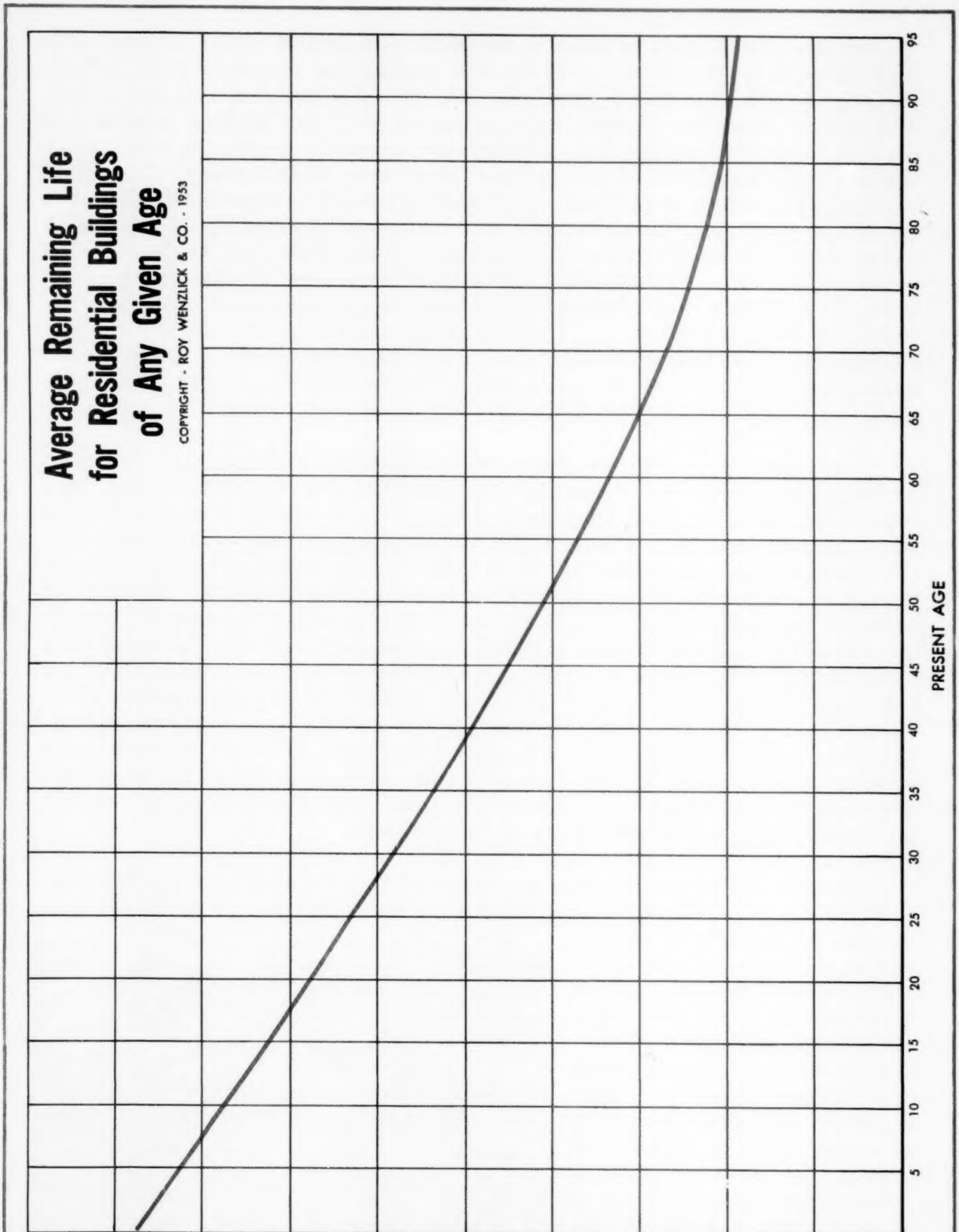
AVERAGE AGE
87½ YEARS
AGE OF BUILDINGS IN YEARS
PERCENT
100
90
80
70
60
50
40
30
20
10
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160
170
180
190

One of these sections is shown in the small reproduction below. Of the buildings shown on these drawings, 43% are still standing and occupied. Each of these buildings is now more than 78 years old, and, of course, many of them are considerably older than that. Based on the survey of the 1, 500 building permits and the buildings on the perspective drawings still remaining in use, the chart on the opposite page was drawn to summarize the findings of this study. This chart shows the percentage of buildings which can reasonably be expected to be still in use at any given age. As no figures were available for buildings more than 78 years old, the probable shape of the curve for older buildings is shown by the heavier dotted line. All life expectancy studies on items as diverse as human beings, telegraph poles, electric motors and railway car wheels show substantially this same shaped curve. The dotted vertical line on this chart shows the average life of residential buildings as determined by this study. This has generally been assumed to be 50 years, but our study would indicate that 93% of all residential buildings are still in use 50 years after construction.

The chart on the back page of this report shows the remaining life which can probably be expected for an average residential building of any given age. This chart may be a little harder for some to understand. Of course, it is apparent that since the average life of all residential buildings was found to be $87\frac{1}{2}$ years, the life expectancy of a new building, built under comparable conditions, would be $87\frac{1}{2}$ years. If, however, the building in question is now 50 years old, the average expected additional life is 41 years in place of $37\frac{1}{2}$, as might be expected. Buildings now $87\frac{1}{2}$ years old, in place of having an average life expectancy of zero, have a probability of 20 additional years. This lengthening of the probable life as the building gets older is due to the fact that the "weaklings" have dropped out in the earlier years. The same thing is quite noticeable in human mortality tables. At birth, the probable life for a male is slightly more than 63 years, but those surviving to 63 have an expectancy of about 14 additional years. These tables include demolitions of buildings as a result of many different causes, many of them not the result of physical deterioration or obsolescence.

Our studies have shown us that age alone destroys a building very slowly. The one building inspected which impressed us as being depreciated 100%, but still standing, was built in 1902 - just 51 years ago. On the other hand, many historic buildings in the East, more than 100 years old, show less physical deterioration than many dwellings built during the last 20 years. Rapid physical deterioration is generally due to either poor construction or poor maintenance; rapid obsolescence is generally due to freakish architecture.


Average Remaining Life
for Residential Buildings
of Any Given Age
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YEARS OF REMAINING LIFE
PRESENT AGE
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
85
90
95
100